(19) World Intellectual Property Organization International Bureau





(43) International Publication Date 30 May 2003 (30.05.2003)

PCT

(10) International Publication Number WO 03/045101 A1

(51) International Patent Classification⁷: H04Q 7/38

(21) International Application Number: PCT/IB02/04830

(22) International Filing Date:

19 November 2002 (19.11.2002)

(25) Filing Language:

English

(26) Publication Language:

English

GB

(30) Priority Data:

0128155.9 23 November 2001 (23.11.2001)

(71) Applicant (for all designated States except US): NOKIA CORPORATION [FI/FI]; Keilalahdentie 4, FIN-02150 ESPOO (FI).

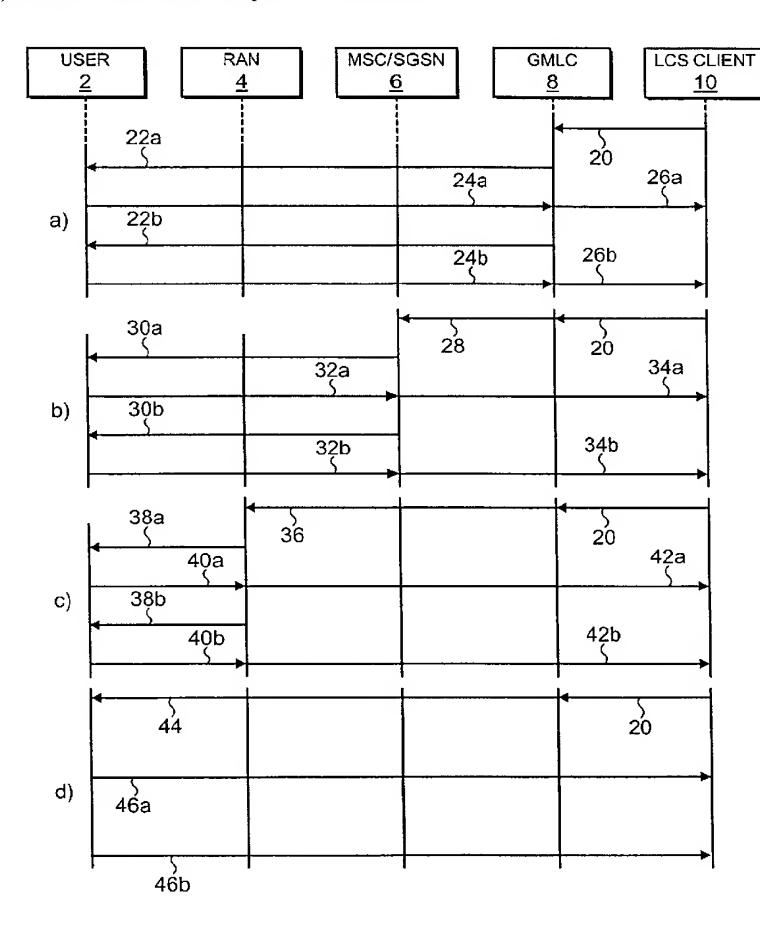
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): MAANOJA,

Markus [FI/FI]; Vermonpolku 4 C 1, FIN-00370 Helsinki (FI). KALL, Jan [FI/FI]; Jupperskogen 2B, FIN-02730 Esbo (FI).

- (74) Agents: WILLIAMS, David, John et al.; Page White & Farrer, 54 Doughty Street, London WC1N 2LS (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: LOCATION REQUEST CONTROL



(57) Abstract: There is disclosed a method and system for providing location services in a mobile wireless network between a user and a location services provider, wherein the control point of periodic location requests is dynamically allocated to one of a plurality of network elements

WO 03/045101 A1

WO 03/045101 A1



ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— with international search report

1

LOCATION REQUEST CONTROL

Field of the Invention

The present invention relates to location services in mobile wireless networks.

Background of the Invention

Location services are known in mobile wireless networks particularly for providing location based information to users of the network. Certain location based information services rely upon the periodic provision of a user's location.

Traffic and navigation applications are two typical examples of location services utilising periodic location updates. For example in traffic guidance applications, e.g. finding optimal road routes, and fleet management, e.g. taxi or delivery services, the provision of location-based information is an essential part of content offering.

Such periodic location based services are typically based on essentially constant updates of location information. In navigation applications the location of the user must be updated frequently otherwise the road assistance, e.g. 'turn left at next junction') is not accurate or useful. Similarly in fleet management the update period is typically in the region of ten's of seconds or minutes depending on the application, and therefore updates are very frequent.

Some periodic tracking applications, however, have relatively long periods between location updates. For example child tracking or business user tracking are examples where the update period may be hours or even days.

Current location services (LCS) specifications offer very limited control possibilities for this sort of periodic positioning. In practice only single requests are supported. No account is taken of the type of location services required.

In addition in most scenarios producing single requests causes excessive signalling within the network resources, and thereby results in poor resource usage.

Embodiments of the present invention aim to address one or more of the above problems and to provide an improved location update request control.

2

Summary of the Invention

STATEMENT OF INVENTION TO FOLLOW WHEN CLAIMS AGREED UPON.

Brief Description of Drawings

For better understanding of the present invention, and to show as to how the same may be carried into effect, reference will now be made by way of example to the accompanying drawings in which:

Figure 1 illustrates a block diagram of a wireless radio network supporting location services; and

Figure 2 illustrates exemplary communications between the elements of Figure 1 in accordance with embodiments of the invention.

Description of Preferred Embodiments of the Invention

The present invention is described hereinafter with reference to a particular set of embodiments. However the invention is not limited to such embodiments. The invention is particularly described by way of reference to a particular wireless mobile network arrangement.

Referring to Figure 1 there is illustrated an exemplary wireless mobile network arrangement. There is a shown a wireless user represented by a mobile telephone (user equipment), designated by reference 2; a radio access network (RAN) designated by reference numeral 4; a mobile switching centre (MSC) or serving GPRS support node (SGSN) designated by reference numeral 6; a gateway mobile location centre (GMLC) 8; a location service (LCS) client 10; and a home location register (HLR) 12. The MSC/SGSN 6, the GMLC 8 and the HLR 12 all form part of the core network.

The implementation of the various blocks of Figure 1 is outside the scope of the present invention, and for the purposes of the discussion of the present invention it is assumed they operate in accordance with standard, known techniques except where stated. The MSC/SGSN block 6 will be implemented as an MSC or SGSN block in

3

dependence on whether the network is a GSM network or a GPRS network respectively.

The home location register is a database which stores the user's service profile. This profile may include, for example, information on allowed services and the UE location on the MSC/SGSN level. The MSC serves the UE in its current location for circuit switched transactions. The SGSN serves the UE for packet switched transactions. The GMLC is the switch point at which the LCS client is connected to the core network. All incoming and outgoing connections to/from the LCS client go through the GMLC. All elements of the core network shown, i.e. the MSC/SGSN and the GMLC, have connections to the HLR.

The user equipment is shown to be a mobile telephone 2 in this example. However the user equipment may be any other type of wireless device equipped with technology for interfacing with the wireless network. The LCS client 10 is a location services provider. The services of the LCS client may be accessed by the user owning or using the user equipment 2 through the wireless network.

In accordance with the present invention, the periodic location update control is dynamically allocated to different elements of the network shown in Figure 1. In practice, as discussed hereinbelow, this means that a control mechanism is introduced such that periodic location requests are handled by different network elements in dependence on other network or service factors. Such factors may include, for example, the location update quality of service (QoS), the periodic interval required for the location updates, and the time over which the periodic location updates will be required. Other parameters may also be used to control the dynamic allocation of the periodic location update.

With reference to Figure 2, the present invention will be further described by way of reference to the control being allocated to various ones of the network elements of Figure 1. As such, four different location update control elements are described.

4

The purpose of the Figures is to illustrate the dynamic control environment of the present invention. The signalling content of periodic location update requests and replies is not affected by the present invention, and as such the content of such signalling is not discussed. It is assumed herein that such signalling is in accordance with techniques known in the art. The formulation of location estimates, and location estimate responses, are not discussed herein.

In practice, the selected control network element initiates periodic location requests (in the downlink) as discussed hereinafter, and sends the resulting periodic location reports (in the uplink), towards the GMLC and the LCS client. The implications of the four alternatives of Figure 1 are described below.

For the purposes of the embodiments described herein with reference to Figure 2, it is assumed that the location information is obtained based on measurements carried out in the user equipment. However one skilled in the art will appreciate that in certain implementations it may be satisfactory to rely upon measurements available in the RAN.

The present invention proposes that the gateway of the core network, in this example the GMLC, preferably chooses which network element is the preferred location for periodic location update control for every periodic location request received from the LCS client. The basis on which the GMLC makes such choice is discussed further hereinafter.

In the first alternative it is proposed that the location update periodic control is handled in the GMLC 8 of the core network. In this example the LCS client requests periodic positioning from the GMLC by sending a signal to the GMLC as represented by arrow 20. The request from the LCS client includes the identification of the period with which location updates are required, and the duration for which location updates should be provided. As is further discussed hereinbelow, in a first step the GMLC 8 determines which of the various network elements should control the location updates.

5

In the example of Figure 2 (a), it is assumed that the GMLC determined that it should be responsible for the control of the location updates. At the appropriate periodic intervals, the GMLC sends a location update request to the user 2 as represented by arrows 22. These requests are passed to the user via the MSC/SGSN 6 and the RAN 4. Responsive to these requests 22 the user provides replies to the GMLC as represented by arrows 24, which are forwarded to the LCS client as represented by arrows 26. The GMLC 8 then continues to initiates individual single LCS requests to the telecom network within the desired time intervals.

The scenario illustrated with reference to Figure 2(a) represents a conventional arrangement for location update request control. In conventional, known systems, such control is always provided in the GMLC 8, or more generally in the gateway of the core network.

This conventional arrangement requires normal LCS request resources for all single LCS requests 22 made by the GMLC, for example routing, screening, privacy checks, paging, etc. The GMLC contacts the HLR 12 for every periodic request, and this may overload the HLR if the periodic interval is very short, or if there are many clients that request periodic reports.

All of these resources are freed after the single requests, i.e. there is no need to keep any dedicated signalling channels for later requests.

In the second alternative it is proposed that the location update periodic control is handled in the MSC/SGSN 6. In this example the LCS client requests periodic location information from the GMLC by sending a signal to the GMLC as represented by arrow 20. The request from the LCS client includes the identification of the necessary information concerning the location updates to be used for location update control. The GMLC 8 uses this information to determine which of the various network elements should control the location updates.

In the example of Figure 2 (b), it is assumed that the GMLC 8 determined that the MSC/SGSN 6 should be responsible for the control of the location updates, and

6

consequently forwards the request for periodic location information to the MSC/SGSN 6 as represented by arrow 28. At the appropriate periodic intervals, the MSC/SGSN 6 sends a location update request to the user 2 as represented by arrows 30. These requests are passed to the user via the RAN 4. Responsive to these requests 30 the user provides replies to the MSC/SGSN 6 as represented by arrows 32, which are forwarded to the GMLC 8 and then the LCS client as represented by arrows 34. The MSC/SGSN 6 then continues to initiate individual single LCS requests to the user within the desired time intervals.

In the embodiment described with reference to Figure 2(b), the periodic request is terminated at the MSC/SGSN, which then initiates multiple single request with required intervals.

In this case example there is no need to make LCS request screening, user privacy checks or routing request from the HLR, after the GMLC carries out such functions initially on receipt of the LCS request. In this respect it should be noted that access to the HLR is probably the biggest bottleneck in the LCS architecture and avoiding such access greatly improves efficiency of resource allocation. However, there is a need for paging and message sending to the RAN, and in this example the UE, depending on where the location calculation is taken place.

In this embodiment of the invention there are further proposed two ways to develop the signalling between the GMLC and the MSC/SGSN to support periodic location handling in the MSC/SGSN and to support MSC/SGSN sending periodic location reports to the GMLC. The first proposed alternative is to enhance the existing and standardised dedicated signalling channel (MAP transactions). The second alternative is to develop connectionless TCAP procedures, which may require adaptation of the current standards and hence further standardisation.

In this embodiment there may be required a new process to transfer LCS control between MSC/SGSNs in inter-MSC handovers. Alternatively, the LCS process could

7

be released in the original MSC, and then may be re-initiated in the new MSC by the GMLC, in the case of inter-MSC handovers.

In the third alternative it is proposed that the location update periodic control is handled in the RAN 4, e.g. in the base station controller (BSC) or in the radio network controller (RNC). In this example the LCS service requests periodic location information from the GMLC by sending a signal to the GMLC as represented by arrow 20. The request from the LCS client includes the identification of the necessary information concerning the location updates to be used for location update control. The GMLC 8 uses this information to determine which of the various network elements should control the location updates.

In the example of Figure 2 (c), it is assumed that the GMLC 8 determined that the RAN 4 should be responsible for the control of the location updates, and consequently forwards the request for periodic location information to the RAN 4, via the MSC/SGSN 6, as represented by arrow 36. At the appropriate periodic intervals, the RAN 4 sends a location update request to the user 2 as represented by arrows 38. Responsive to these requests 38 the user provides replies to the RAN 4 as represented by arrows 40, which are forwarded to the MSC/SGSN 6, the GMLC 8 and then the LCS client as represented by arrows 42. The RAN 4 then continues to initiate individual single LCS requests to the user within the desired time intervals.

Hence in this embodiment the periodic request is routed to the radio access network 4 which then calculates the location of the user with the help of the user equipment, as illustrated in Figure 2(c).

However in an alternative arrangement the location of the user may be determined in the RAN by using the local information available in the RAN itself. If the terminal measurements/calculation are needed then these are requested with the required time intervals from the user equipment as discussed hereinabove with reference to Figure 2(c).

8

The provision of the location update control in the RAN optimises most of the LCS request procedures, leaving only terminal communication and actual position calculation for periodic control.

In this embodiment of the invention it is proposed that there is provided a dedicated signalling path between the GMLC, the MSC/SGSN, and the RNC/BSC to support periodic location handling in the RNC/BSC of the RAN and to support the RNC/BSC sending periodic location reports.

This embodiment may require a process to transfer LCS control between radio network controllers in case of inter-BSC/RNC handover. Alternatively this may be handled by the MSC/SGSN.

In the fourth alternative it is proposed that the location update periodic control is handled in the user equipment 2, e.g. in a mobile telephone. In this example the LCS service again requests periodic location information from the GMLC by sending a signal to the GMLC as represented by arrow 20. The request from the LCS client includes the identification of the necessary information concerning the location updates to be used for location update control. The GMLC 8 uses this information to determine which of the various network elements should control the location updates.

In the example of Figure 2 (d), it is assumed that the GMLC 8 determined that the user equipment 2 should be responsible for the control of the location updates, and consequently forwards the request for periodic location information to the user equipment 2, via the MSC/SGSN 6 and the RAN 4, as represented by arrow 44. At the appropriate periodic intervals, the user equipment provides location information to the LCS client via the RAN 4, the MSC/SGSN 6 and the GMLC 8. The user equipment 2 then continues to initiate individual single LCS replies to the LCS client within the desired time intervals.

In this embodiment the user equipment itself calculates it's own position and sends the periodic location reports. This optimises all the LCS procedures, leaving only the UE based position calculation to the UE itself.

9

This embodiment can be handled, for example, by an application in the UE which is in contact directly with the LCS client. This requires a dedicated signalling connection between the UE and LCS client to report position estimates. With this embodiment the standardized application interface for location services being developed in the LIF industry forum may be enhanced to support periodic location calculation in the UE and to enable the UE to send periodic location reports to the LCS client or to any other server.

With this embodiment an alternative to the above solution is to enable the GMLC to request the MSC/SGSN to request the UE to perform periodic positioning and to send the periodic location reports to the MSC/SGSN, the GMLC, and the LCS client. This solution requires changes in the MAP and LCS signalling standards being developed in 3GPP for Mobile terminated location request.

In this embodiment handovers are handled automatically because the signalling channel is "moving" with the terminal.

The implementation of the GMLC 8 in order to select the appropriate network element for controlling the periodic location updates may be implementation dependent.

In one arrangement all (or only selected) network elements are simultaneously available and selectable to perform the periodic location request control. The element selection can be configured based on a number of possibilities, for example, the operator's business logic, network load etc. Examples are discussed hereinbelow.

For location requests with very long calculation periods (e.g. hours or days) the control may be preferably implemented in the GMLC. In this case there is no benefit in optimising the LCS request procedures over dedicated signalling channel between the GMLC and the MSC in the RAN. In practice this channel reserves more resources than would performing all the procedures once a day, for example.

For location requests with very short time intervals (e.g. seconds) the control may be best handled in the RAN or the UE. The telecom network would be enormously

10

loaded if all normal LCS procedures would have to be performed as requested by GMLC at this periodic interval. The invention enables minimisation of the resources reserved for periodic location reports in every network element.

For location requests in which the time period is relatively short, but where the required accuracy is very low, it may be preferable to calculate the position based on information already in GMLC (using history data, MSC area, etc). Therefore in this case it is most feasible to have GMLC control the periodic reports.

For location requests in cases where the requested interval is relatively long, but where the QoS requirement is high and the overall time for periodic control is short, it may be preferable to handle the request in the RAN or in the UE.

It should be also noted that wherever the periodic update requests are controlled it is preferable to be able to release or stop the process. This may be required either by an LCS client request (LCS periodic location update release) or because the user profile has changed (privacy profile may be changing according to the time of day). The invention thus provides for these procedures for release control and enhancements to user privacy control.

It should be noted that handling optimisation is based on the fact that complexity of LCS signalling is related to LCS request handling. Therefore in this invention the request direction (from LCS client to calculation entity) is optimised, the response direction (location coordinate response from calculation entity to LCS client) is reporting all the results periodically.

The present invention thereby introduces a system that enables periodic location requests and their handling in the most optimal elements of the network according to location quality of service and calculation period.

The present invention has been described herein by way of reference to specific, non-limiting examples. It should be understood that the invention is more generally applicable than the examples given herein. One skilled in the art will understand the

11

broader applicability of the present invention. The scope of the invention is defined by the appended claims.

12

CLAIMS

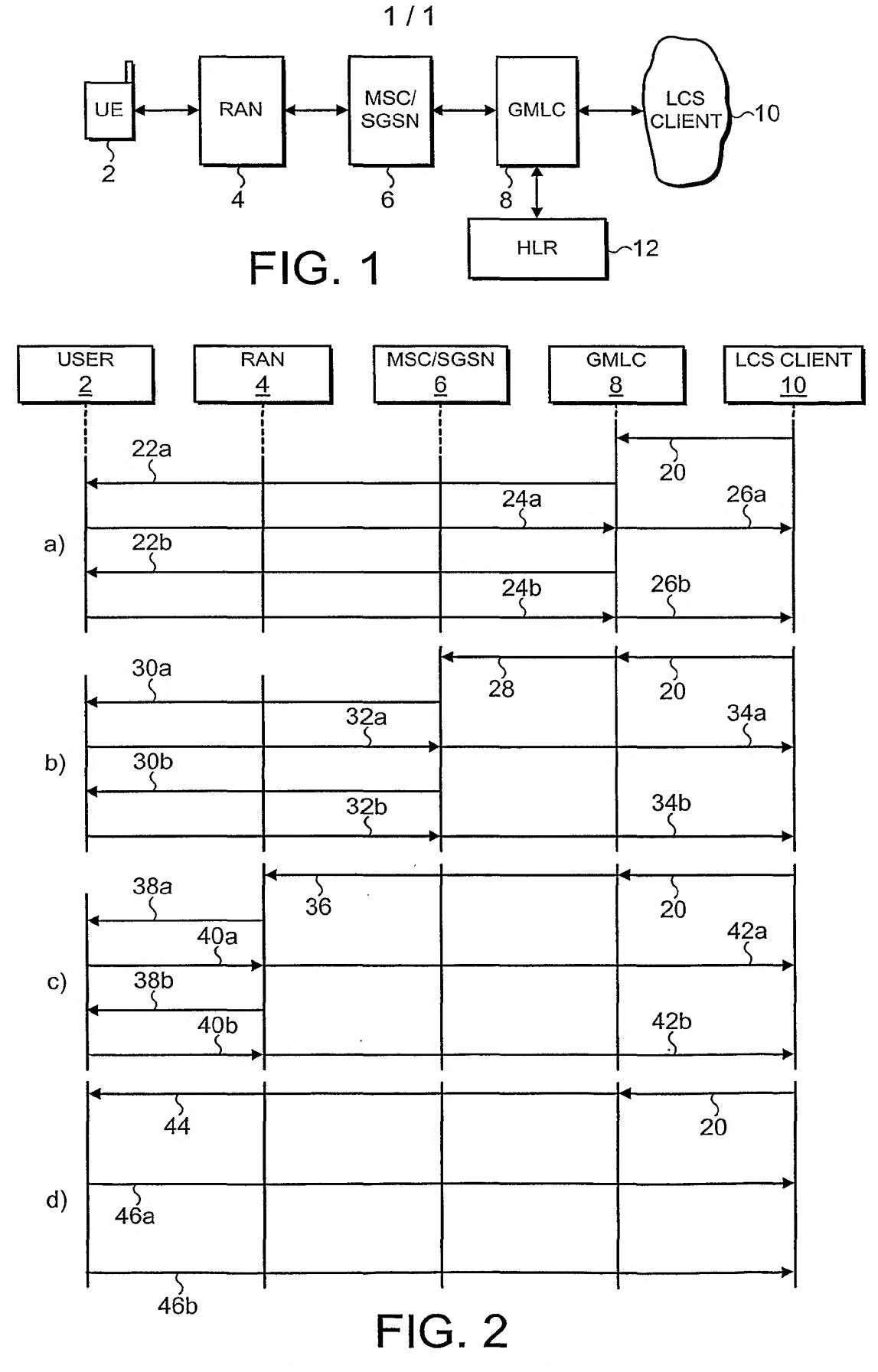
- 1. A method of providing location services in a mobile wireless network between a user and a location services provider, wherein the control point of periodic location requests is dynamically allocated to one of a plurality of network elements.
- 2. A method according to claim 1 wherein the plurality of network elements include at least one of: user equipment; an element of the radio access network; or an element of the core network.
- 3. A method according to claim 1 or claim 2 wherein core network carries out the step of dynamically allocating the control point.
- 4. A method according to claim 3 wherein a gateway of the core network carries out said step.
- 5. A method according to any one of claims 1 to 4 wherein the control point is dynamically allocated in dependence on characteristics of a location service request.
- 6. A method according to claim 5 wherein the characteristics include at least one of: a quality of service level to be supported; the periodic interval of the location updates; the current network load; or the operators business logic.
- 7. A method according to any one of claims 1 to 6 wherein the plurality of network elements includes a gateway of the core network.

* 1 - 1

- 8. A method according to claim 7 wherein the gateway is a gateway mobile location centre.
- 9. A method according to any one of claims 1 to 6 in a packet switched network, wherein the plurality of network elements includes a serving GPRS support node.
- 10. A method according to any one of claims 1 to 6 in a circuit switched network, wherein the plurality of network elements includes a mobile switching centre.

13

- 11. A mobile wireless network supporting location services and comprising at least a radio access network, a core network, and a location services provider, wherein the network further comprises means for dynamically allocating the control point of periodic location requests to one of a plurality of network elements.
- 12. A mobile wireless network according to claim 11 wherein the means for dynamically allocating the control point comprises a network element of the core network.
- 13. A mobile wireless network according to claim 12 wherein said network element is a gateway of the core network.
- 14. A mobile wireless network of claim 13 wherein said gateway is a gateway mobile location centre.
- 15. A mobile wireless network according to any one of claims 11 to 14 wherein the plurality of network elements include at least one of user equipment; an element of a radio access network; and an element of a core network.
- 16.A packet switched mobile wireless network according to claim 15 wherein the element of the radio access network is a serving GPRS support node.
- 17.A circuit switched mobile access network according to claim 15 wherein the element of the radio access network is a mobile switching centre.
- 18.A mobile wireless network according to any one of claims 15 to 17 wherein the element of the core network is a gateway element.



SUBSTITUTE SHEET (RULE 26)

INTERNATIONAL SEARCH REPORT

PCT/IB 02/04830

According to forematical Pleant Classification (PC) or to both mational electrification and IPC B. FIELDS SEARCHED Minimum documentation searched (desertication system followed by desattication systehola) IPC 7 H040 Decommentation searched other than minimum documentation to the obtant that such documents are included in the fields searched Electrosate date base consisted during fine inhamatical search (name or data Search forms or data Search forms as described association of the field search forms as described during fine inhamatical search (name or data Search forms as data Search forms as described during fine inhamatical search (name or data Search forms as described in the fields searched with the fields search forms as described during fine inhamatical search (name or data Search forms as described in the fields search forms as described in the field search forms as described in the continuation of box C. In Patient documents are intend in the continuation of box C. In Patient family members are likeds in the continuation of box C. In Patient family members are likeds in the continuation of box C. In Patient family members are likeds in the continuation of box C. In Patient family members are likeds in the continuation of box C. In Patient family members are likeds in the continuation of box C. In Patient family members are likeds in the continuation of box C. In Patient family members are likeds in the continuation of the											
Monitoring to control to the control of the control	A. CLASSII IPC 7	FICATION OF SUBJECT MATTER H04Q7/38									
Documentation searched (desafficiation system followed by desafficiation symbols) TPC 7 H04Q	According to	International Patent Classification (IPC) or to both national classification	ation and IPC								
Decumentation searched other than minimum decomentation to the extent that such occuments are foliated searched Electronic data: base consulted during the international search (name of data bases and, where practical, search lettres assert) EPO-Internal Ciscopory** Cistion of document, with indication, where appropriate of the relevant passages Palevant to claim No. Who 01 69951 A (NOKIA NETWORKS 0Y; STAACK JENS PETER (FI); KALL JAN (FI); MUHONEN) 20 September 2001 (2001-09-20) page 5, 1ime 8 — line 25 page 7, 1ime 15 — page 8, 1ime 6 page 13, 1ime 1 — line 32 figures 1,4 A Us 6 295 454 B1 (BOLTZ DAYID ET AL) 25 September 2001 (2001-09-25) column 2, line 10 — line 67 column 4, line 9 —column 5, line 6 figures 2-9 Futher document but published on or offer this international continued to be page 13 in the service of the document but published on or offer this international catalation of the appoints of the services of the document but published on or offer this international catalation of the appoints of the services o											
Documentation searched other than minimum documentation to the extent that auch documents are included in the fields cearched Electronic delat base consulted during the international search (mame of define base and, where produced, search forms used) EPO-Internal C. DOCUMENTS CONSIDERED TO BE RELEVANT CReporty Classion of document, with indication, where appropriate of the relevant passages Pelevant to claim No. X			on symbols)								
EPO-Internal C. DOCUMENTS CONSIDERED TO BE RELEVANT Carcopoty* Citation of document, with indication, whose appropriate of the relevant passages New York of the Constitution of document, with indication, whose appropriate of the relevant passages New York of the Constitution of document, with indication, whose appropriate of the relevant passages New York of the Constitution of document, with indication, whose appropriate of the relevant passages New York of the Constitution	TPC / HO4Q										
EPO-Internal C. DOCUMENTS CONSIDERED TO BE RELEVANT Carcopoty* Citation of document, with indication, whose appropriate of the relevant passages New York of the Constitution of document, with indication, whose appropriate of the relevant passages New York of the Constitution of document, with indication, whose appropriate of the relevant passages New York of the Constitution of document, with indication, whose appropriate of the relevant passages New York of the Constitution											
EPO-Internal C. DOCUMENTS CONSIDERED TO BE RELEVANT Caregopy* Citation of document, with indication, where appropriate, of the relevant passages Polevant to claim No. X	Documentat	ion searched other than minimum documentation to the extent that s	uch documents are included in the fields	searched							
EPO-Internal C. DOCUMENTS CONSIDERED TO BE RELEVANT Caregopy* Citation of document, with indication, where appropriate, of the relevant passages Polevant to claim No. X											
C. DOCUMENTS CONSIDERED TO BE RELEVANT C. Segory 1 Citation of document, with indication, where appropriate, of the relevant passages	Electronic da	ata base consulted during the international search (name of data ba	se and, where practical, search terms us	ed)							
C. DOCUMENTS CONSIDERED TO BE RELEVANT C. Segory 1 Citation of document, with indication, where appropriate, of the relevant passages	 EPO-Tni	terna 1									
Category* Citation of document, with indication, where appropriate, of the relevant passages Relevant to claim No. X											
Category* Citation of document, with indication, where appropriate, of the relevant passages Relevant to claim No. X											
Category* Citation of document, with indication, where appropriate, of the relevant passages Relevant to claim No. X											
WO 01 69951 A (NOKIA NETWORKS OY; STAACK JENS PETER (FI); KAALL JAN (FI); MUHONEN) 20 September 2001 (2001-09-20) page 5, line 8 - line 25 page 7, line 15 -page 8, line 6 page 13, line 1 - line 32 figures 1,4 A US 6 295 454 B1 (BOLTZ DAYID ET AL) 25 September 2001 (2001-09-25) column 2, line 10 - line 67 column 4, line 9 -column 5, line 6 figures 2-9 Further documents and letted in the continuation of box C. X Patont family members are listed in annex. *Special categories of cited documents: *A document obtaining the general state of the art which is not considered to be of particular relevance or the special research case specifies *I document of the special reason (as specifies) *C document fetering to an oral disclosure, use, exhibition or other research case for the special research case specifies *C document published prior to the international filing date but stater than the priority data doalmed Date of the actual completion of the international filing date but stater than the priority data calmed *C document published prior to the international filing date but stater than the priority data calmed *C document published prior to the international filing date but stater than the priority data calmed *C document published prior to the international filing date but stater than the priority data calmed *C document published prior to the international search 10 January 2003 *Name and mailing addieses of the ISA. *Everyone Position of the ISA. *A US 6 295 5 454 B1 (BOLTZ DAYID **E earlier document but published on or after the international filing date but stater than the priority data calmed **C document member of the series position or other research and published on or after the international filing date but start the priority data calmed **C document published prior to the international search **Decompany of the international search **C document pu	C. DOCUME	ENTS CONSIDERED TO BE RELEVANT									
JENS PETER (FI); KAALL JAN (FI); MUHONEN) 20 September 2001 (2001-09-20) page 5, line 8 - line 25 page 7, line 15 -page 8, line 6 page 13, line 1 - line 32 figures 1,4 A US 6 295 454 B1 (BOLTZ DAVID ET AL) 25 September 2001 (2001-09-25) column 2, line 10 - line 67 column 4, line 9 -column 5, line 6 figures 2-9 Futher documents are listed in the continuation of box C. X Patent family members are listed in annox. Y Special cetegories of chied documents: "Special cetegories of chied documents: "A' document defining the general state of the art which is not considered to be of particular relevance "I'm decomment which may throw doubts on priority claim(s) or which is clied to establish the publication date of another children or other special reason (as specially except with the contact page of the contact page	Category °	Citation of document, with Indication, where appropriate, of the rel	evant passages ,	Relevant to claim No.							
JENS PETER (FI); KAALL JAN (FI); MUHONEN) 20 September 2001 (2001-09-20) page 5, line 8 - line 25 page 7, line 15 -page 8, line 6 page 13, line 1 - line 32 figures 1,4 A US 6 295 454 B1 (BOLTZ DAVID ET AL) 25 September 2001 (2001-09-25) column 2, line 10 - line 67 column 4, line 9 -column 5, line 6 figures 2-9 Futher documents are listed in the continuation of box C. X Patent family members are listed in annox. Y Special cetegories of chied documents: "Special cetegories of chied documents: "A' document defining the general state of the art which is not considered to be of particular relevance "I'm decomment which may throw doubts on priority claim(s) or which is clied to establish the publication date of another children or other special reason (as specially except with the contact page of the contact page											
20 September 2001 (2001–09–20) page 5, line 8 – line 25 page 7, line 15 – page 8, line 6 page 13, line 1 – line 32 figures 1, 4 A US 6 295 454 B1 (BOLTZ DAVID ET AL) 25 September 2001 (2001–09–25) column 2, line 10 – line 67 column 4, line 9 –column 5, line 6 figures 2–9 Turner documents are listed in the continuation of box C. *Special categories of cited documens: "A' document defining the general state of the art which is not considered to be of particular relevance "E' earlier document which may throw doubte on priority dialn(e) or citation or other special rate for the considered to be of particular relevance "I' document defining the general state of the art which is not considered to be of particular relevance "C' earlier document which may throw doubte on priority dialn(e) or citation or other special rate for the considered to be of particular relevance "P' document afterfing to an oral disable using a disable but lator than the priority data claimed invention "P' document published or for to the international filing date but lator than the priority data claimed invention The actual published or to the international search 10 January 2003 Name and mining address of the ISA Luropean Platent Office, P.B. 5816 Patentliana 2 NL - 2200 FM Filipson, V. S. 1851 epo ni, III. Pace policies. D Recording D Authorized officer Authorized officer Authorized officer	X			1,2,9-18							
page 5, line 8 - line 25 page 7, line 15 - page 8, line 6 page 13, line 1 - line 32 figures 1,4 A US 6 295 454 B1 (BOLTZ DAVID ET AL) 25 September 2001 (2001-09-25) column 2, line 10 - line 67 column 4, line 9 -column 5, line 6 figures 2-9 Futher documents are listed in the continuation of box C. Special categories of cited documents: A cocument defining the general state of the art which is not considered to be of particular relevance or short in the production of the comment which may throw doubt on priority claim(s) or which is detected to see of particular relevance with the production of the comment published on or after the international filing date 1º document which may throw doubt on priority claim(s) or which is detected to see of particular relevance in the claimed invention which may throw doubt on priority claim(s) or which is detected to see of particular relevance in the claimed invention cannot be considered hore or other comments after one of the section of the comment of the comment published prior to the international filing date but later than the priority date oldinated invention cannot be considered to involve an invention cannot be considered to invention alone invention cannot be considered to invention the comment of the comment published prior to the international filing date but later than the priority date oldinated invention are more offer such document for the manner. 10 January 2003 Name and malting address of the ISA Authorized officer Pachology D. Authorized officer Pachology D. Pachology D. Authorized officer			MUHONEN)								
page 7, line 15 -page 8, line 6 page 13, line 1 - line 32 figures 1,4 A US 6 295 454 B1 (BOLTZ DAVID ET AL) 25 September 2001 (2001-09-25) column 2, line 10 - line 67 column 4, line 9 -column 5, line 6 figures 2-9 Petent family members are listed in annex. *Special categories of cited documents: A' document defining the general state of the art which is not considered to be of particular relevance 'S special categories of cited documents: A' document defining the general state of the art which is not considered to be of particular relevance 'S geclal categories of cited documents: 'A' document but published on or defer the international finance of the considered to be of particular relevance or priority cited and not in contict with the application but did not understand the principle or theory underlying the invention cannot be considered to be of particular relevance or considered to be of particular relevance or priority cited and not in contict with the application but did not understand the principle or theory underlying the invention cannot be considered to be of particular relevance; the claimed invention cannot be considered novel or cannot be considered to be considered to be considered to be of particular relevance; the claimed invention cannot be considered to be of particular relevance; the claimed invention cannot be considered to be of particular relevance; the claimed invention cannot be considered to be of particular relevance; the claimed invention cannot be considered to be of particular relevance; the claimed invention cannot be considered to be consi		·									
page 13, fine 1 - line 32 figures 1,4 A US 6 295 454 B1 (80LTZ DAVID ET AL) 25 September 2001 (2001-09-25) column 2, line 10 - line 67 column 4, line 9 -column 5, line 6 figures 2-9 Patent family members are listed in annex. Patent family members are listed in annex. To later document befining the general state of the art which is not considered to be of particular relevance of the actual compellation but published on or after the international filing date or priority date and not in conlict with the application but office date in the considered to be of particular relevance or which is clated to establish the publication date of another clatable or other respectal reason (as specified) "C' document which may throw double on priority claim(s) or which is clated to establish the publication date of another clatable or other respectal reason (as specified) "C' document referring to an oral disclosure, use, exhibition or other respectal reason (as specified) "C' document referring to an oral disclosure, use, exhibition or differ means an oral disclosure, use, exhibition or differ means an oral disclosure, use, exhibition or differ means and making address of the tsp. To January 2003 Name and making address of the 152. Lucypean Patent Ciffce, P.B. 5618 Patentiana 2 N.L 2200 HV Rijawik T.E. (+31-70) 340-2404, T. 31 651 epp nl. Pachalogo. D. Pachalogo. D.											
A US 6 295 454 B1 (BOLTZ DAVID ET AL) 25 September 2001 (2001-09-25) column 2, line 10 - line 67 column 4, line 9 -column 5, line 6 figures 2-9 Patent family members are listed in ennex. *Special categories of cited documents: A' document defining the general state of the art which is not considered to be of particular relevance Considered to be of particular relevance If earlier document but published on or after the international filing date or which is cited to establish the publication date of another which is cited to establish the publication date of another which is cited to establish the publication date of another challen or other special reason (as specified) Codement relaring to an oral disclosure, use, ashibition or other special reason (as specified) Codement relaring to an oral disclosure, use, ashibition or other special reason (as specified) Codement relaring to an oral disclosure, use, ashibition or other special reason (as specified) Codement relaring to an oral disclosure, use, ashibition or other special reason (as specified) Codement relaring to an oral disclosure, use, ashibition or other special reason (as specified) Codement relaring to an oral disclosure, use, ashibition or other second occurrence or oral disclosure and the principle of the decument is combined to ordinate stream to considered to involve an inventive stop when the document is combined who en or more other stuch documents are the combination being obvious to a person exilited to the combination being obvious to a person exilited to the combination being obvious to a person exilited to the combination being obvious to a person exilited to the combination being obvious to a person exilited to the combination being obvious to a person exilited to the combination being obvious to a person exilited to the combination being obvious to a person exilited to the combination being obvious to a person exilited to the combination being obvious to a person exilited to the combination being obvious to a person exilited to	}										
25 September 2001 (2001–09–25) column 2, line 10 – line 67 column 4, line 9 –column 5, line 6 figures 2–9 Further documents are listed in the continuation of box C. Special categories of cited documents: Special categories of cited documents: A document defining the general state of the art which is not considered to be of patieutar relevance Fer earlier document but published on or after the international filing date or or priority delar and not in conflict with the application but dated to understand the principle or theory underlying the invention or other special reason (as specified) Courned which is died to establish the publication date of another datation or other special reason (as specified) Courned to particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is taken alone with the priority data claimed invention cannot be considered to involve an inventive step when the document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is taken alone with the document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the common be considered to involve an inventive step when the document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document between the considered to involve an inventive step when the common be considered to involve an inventive step when the document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document between the cannot be considered to involve an inventive step when the document between the cannot be considered to involve an inventive step when the common become the claim of the control terms the cannot be considered to involve an inventive step when the common become the cannot be considered to involve an inventive step when the common become the claim the art. 10 January 2003 Authorized of		figures 1,4									
25 September 2001 (2001–09–25) column 2, line 10 – line 67 column 4, line 9 –column 5, line 6 figures 2–9 Further documents are listed in the continuation of box C. Special categories of cited documents: Special categories of cited documents: A document defining the general state of the art which is not considered to be of patieutar relevance Fer earlier document but published on or after the international filing date or or priority delar and not in conflict with the application but dated to understand the principle or theory underlying the invention or other special reason (as specified) Courned which is died to establish the publication date of another datation or other special reason (as specified) Courned to particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is taken alone with the priority data claimed invention cannot be considered to involve an inventive step when the document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is taken alone with the document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the common be considered to involve an inventive step when the document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document between the considered to involve an inventive step when the common be considered to involve an inventive step when the document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document between the cannot be considered to involve an inventive step when the document between the cannot be considered to involve an inventive step when the common become the claim of the control terms the cannot be considered to involve an inventive step when the common become the cannot be considered to involve an inventive step when the common become the claim the art. 10 January 2003 Authorized of	Δ	119 6 205 /15/ R1 (ROLTZ DAVID FT	ΔΙΛ	1-10							
Column 2, line 10 - line 67 column 4, line 9 -column 5, line 6 Figures 2-9 Futher documents are listed in the continuation of box C. Special categories of cited documents: 'A' document defining the general state of the art which is not considered to be of particular relevance for earlier document bublished on or after the international filling date or priority date and not in conflict with the application but clast to understuding the published one after the international filling date or priority date and not in conflict with the application but clast to understuding the published one after the international filling date or priority date and not in conflict with the application but clast to understuding the publication date of another which is clied to establish the publication date of another datation or other special reason (as specified) 'C' document of particular relevance; the claimed invention cannot be considered to enowize all when document is taken alone vivolves an invented set pwhen the document to particular relevance; the claimed invention cannot be considered to involve an invented set pwhen the document is taken alone vivolves an invented set pwhen the document to particular relevance; the claimed invention cannot be considered to involve an invented set pwhen the document to particular relevance; the claimed invention cannot be considered to involve an invented set pwhen the document to particular relevance; the claimed invention cannot be considered to involve an invented set pwhen the document to particular relevance; the claimed invention cannot be considered to involve an invented set pwhen the document to particular relevance; the claimed invention cannot be considered to involve an invented set pwhen the document to particular relevance; the claimed of the comment of particular relevance; the claimed of the comment is taken alone v)		AL /	1 -18							
Further documents are listed in the continuation of box C. Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance or particular relevance or particular relevance or particular relevance or clare the published on or after the international filing date of priority date and not in contilict with the application but cited to enderstand the principle or theory underlying the involved in the state of the carried document but published on or after the international filing date or priority claim(s) or which is taked to establish the publication date of another citation or other special reason (as specified) "C" document which may throw doubte on priority claim(s) or other means to claim the priority date and not be considered to involve an inventive step when the document its taken alone or claim or the step when the document is combined with one or more other stud document is combined with one or more other stud documents, such combination being obvious to a person skilled in the art. "S" document provided with one or more other stud documents, such combination being obvious to a person skilled in the art. "S" document provided the same patent family Date of the actual completion of the international search To January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 (N 2280 HV Rijswijk Tel. (+31-70) 840-2404, Tx. 31 651 epp nl.		·									
Further documents are listed in the continuation of box C. Special categories of cited documents: 'A' document defining the general state of the art which is not considered to be of particular relevance 'E' sartier document but published on or after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention or which is cited to establish the publication date of another citation or other special reason (as specified) 'C' document referring to an oral disclosure, use, exhibition or other means 'P' document published prior to the International filing date but later than the priority date cielmed Date of the actual completion of the International search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B, 5818 Patentian 2 NL — 2280 HV Rijsvijk Tel. (+21-70) 340–2640, Tx. 31 651 epp n),		column 4, line 9 -column 5, line	6								
Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "I" document which may throw doubte on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed Date of the actual completion of the international search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HY Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,		figures 2-9									
Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "I" document which may throw doubte on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed Date of the actual completion of the international search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HY Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,		Tang gant from thing date.									
Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "I" document which may throw doubte on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed Date of the actual completion of the international search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HY Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,											
Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "I" document which may throw doubte on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed Date of the actual completion of the international search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HY Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,											
Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "I" document which may throw doubte on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed Date of the actual completion of the international search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HY Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,											
Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "I" document which may throw doubte on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed Date of the actual completion of the international search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HY Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,											
Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "I" document which may throw doubte on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed Date of the actual completion of the international search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HY Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,											
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filling date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document published prior to the international filling date but later than the priority date claimed "P" document published prior to the international filling date but later than the priority date claimed Date of the actual completion of the international search Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,	Further documents are listed in the continuation of box C.		χ Patent family members are listed in annex.								
Considered to be of particular relevance "E" earlier document but published on or after the international filing date "L' document which may throw doubte on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O' document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed Date of the actual completion of the international search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo ni,	° Special categories of cited documents:		"T" later document published after the in	nternational filing date							
*E' earlier document but published on or after the international filing date "L' document which may throw doubte on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O' document referring to an oral disclosure, use, exhibition or other means "P' document published prior to the international filing date but later than the priority date claimed Date of the actual completion of the international search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 N.L. – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl,	"A" document defining the general state of the lart which is not considered to be of particular relevance.		cited to understand the principle or	th the application but theory underlying the							
"L" document which may throw doubte on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filling date but later than the priority date claimed "Date of the actual completion of the international search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B, 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,	"E" earlier document but published on or after the international			e claimed invention							
which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filling date but later than the priority date claimed Date of the actual completion of the international search 10 January 2003 Name and malling address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, V" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "8" document member of the same patent family Date of mailing of the international search report 16/01/2003 Authorized officer	"L" document which may throw doubts on priority claim(s) or		cannot be considered novel or cann	not be considered to							
"O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed Date of the actual completion of the international search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl,	which is cited to establish the publication date of another		"Y" document of particular relevance; the	e claimed invention							
P document published prior to the International filing date but later than the priority date claimed Date of the actual completion of the international search Date of mailing of the international search patent family Date of mailing of the international search patent family Date of mailing of the international search report 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,	"O" document referring to an oral disclosure, use, exhibition or		document is combined with one or I	more other such docu-							
Date of the actual completion of the international search 10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Date of mailing of the international search report 16/01/2003 Authorized officer Pachology D	*P* document published prior to the international filing date but		in the art.								
10 January 2003 Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Pachology D											
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Pachology D	Date of the a	actual completion of the international search	Date of mailing of the international s	search report							
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl,	10 January 2003		16/01/2003								
NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Pacholog D			Authorized officer								
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,	NL – 2280 HV Ríjswíjk										
·	Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Pacholec, D								

INTERNATIONAL SEARCH REPORT

Information on patent family members

PCT/IB 02/04830

	Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO O	169951	A	20-09-2001	AU WO EP	3929201 A 0169951 A1 1264493 A1	24-09-2001 20-09-2001 11-12-2002
US 62	295454	B1	25-09-2001	NONE		